

What is claimed is:

1. A method for detecting a pretilt angle of an element in which the direction of orientation of molecules is twisted from a light incident side to light outgoing side, the method comprising:

measuring transmitted light intensity of light that has come from the light incident side for a plurality of light incident angles;

analyzing dependence of the measured transmitted light intensity for the plurality of light incident angles; and

determining the pretilt angle of the element based upon the analysis results.

2. A method for detecting a pretilt angle of an element in which the direction of orientation of molecules is twisted from a light incident side to a light outgoing side, the method comprising:

measuring transmitted light intensity of light that has come from the light incident side for a plurality of light incident angles and at a plurality of optical element arrangements for each light incident angle;

analyzing dependence of the measured transmitted light intensity for the plurality of light incident angles; and

determining the pretilt angle of the element based upon the analysis results.

3. The method as described in Claim 1 or Claim 2, wherein in the step of analyzing the dependence of the measured transmitted light intensity for the plurality of light incident angles, an apparent retardation for the plurality of light incident angles is determined based upon the measured transmitted light intensity for the plurality of light incident angles, and in the step of detecting the pretilt angle of the element based upon the analysis results, the pretilt angle of the element is determined based upon the determined apparent retardation for the plurality of light incident angles.

4. The method as described in Claim 1 or Claim 2, wherein in the step of analyzing the dependence of the measured transmitted light intensity for the plurality of light incident angles, Stokes parameters for the plurality of light incident angles are

determined based upon the measured transmitted light intensity for the plurality of light incident angles, and in the step of detecting the pretilt angle of the element based upon the analysis results, the pretilt angle of the element is determined based upon the determined Stokes parameters for the plurality of light incident angles.

5. The method as described in Claim 4, wherein in the step of detecting the pretilt angle of the element based upon the analysis results, an apparent retardation for the plurality of light incident angles is determined based upon the determined Stokes parameters for the plurality of light incident angles, and the pretilt angle of the element is determined based upon the determined apparent retardation for the plurality of light incident angles.

6. The method as described in Claim 3 or Claim 5, wherein in the step of detecting the pretilt angle of the element based upon the analysis results, an average tilt angle is determined based upon the determined apparent retardation for the plurality of light incident angles, and the pretilt angle is determined based upon the determined average tilt angle.

7. The method as described in any claim of Claims 3 to 6, wherein in the step of measuring the transmitted light intensity for the plurality of light incident angles, the transmitted light intensity is measured in a state in which the following relationship is valid between the orientation direction α^{in} (rad) of molecules at the light incident side interface of the element and the twist angle Φ (rad) of the element:

$$\tan \alpha^{\text{in}} = -\frac{\Phi - \sin \Phi}{1 - \cos \Phi}.$$

8. The method as described in any of Claims 1 to 7, wherein in the step of measuring the transmitted light intensity for the plurality of light incident angles, monochromatic light is incident from the light incident side.

9. An apparatus for detecting a pretilt angle arranged in the following sequence: a light source, a polarizer, an element in which the direction of orientation of molecules is

15. The apparatus as described in Claim 12 or Claim 14, wherein the processing device determines the average tilt angle based upon the determined apparent retardation for the plurality of light incident angles and determines the pretilt angle based upon the determined average tilt angle.

$$\tan \alpha^{\text{in}} = -\frac{\Phi - \sin \Phi}{1 - \cos \Phi}.$$

17. The apparatus as described in any of Claims 9 to 16, comprising a light source emitting monochromatic light or a converter for converting the light emitted by a light source into monochromatic light.